

A B S T R A C T

A METHOD AND APPARATUS FOR ETCHING A SUBSTRATE WITH A
VERY HIGH POWER INDUCTIVELY-COUPLED PLASMA

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According to the invention, etching is performed in a reaction chamber (1) by subjecting a substrate (16) biased by a bias generator (15) to a plasma generated by a plasma source (4) contained in a leakproof wall (5) of dielectric material surrounded by an inductive coupled antenna (6) powered by a radiofrequency generator (7). Control means (13) control solenoid valves (12a, 12b, 12c) and the radiofrequency generator (7) so as to produce a prior step of establishing the plasma excitation power progressively, during which step an inert gas such as argon or nitrogen is injected into the reaction chamber (1), and the power delivered by the radiofrequency generator (7) is raised progressively until it reaches a nominal power. This avoids applying thermal shock to the leakproof wall (5) of dielectric material that might otherwise destroy the wall, thus making it possible to plasma excitation powers that are greater than 3000 W.

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